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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/454,566	12/07/1999	DAVID T. LINDNER	SAA-25 (122.161)	3884

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SQUARE D COMPANY
INTELLECTUAL PROPERTY DEPARTMENT
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EXAMINER

LIN, KENNY S

ART UNIT	PAPER NUMBER
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2154

DATE MAILED: 06/05/2003

10

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/454,566

Applicant(s)

LINDNER ET AL.

Examiner

Kenny Lin

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 January 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-7 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-7 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s) _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

1. Claims 1-7 are presented for examination.

Claim Rejections - 35 USC § 112

2. The text of those sections of Title 35, U.S. code not included in this office action can be found in prior office action.
3. Claim 1 is rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for making a permanent-type connection for the control element or the monitoring element thereby to specialize the general purpose query protocol, does not reasonably provide enablement for being used by the industrial control system in performing frequent communication of control and monitoring information between the controller and the control element or the monitoring element. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make the invention commensurate in scope with these claims. When a permanent-type connection for the control element is made with the controller, does it also monitor information? If yes, how is monitoring process done when there is not a connection between the controller and the monitoring element? When a permanent-type connection for the monitoring element is made with the controller, does it also perform frequent communication of control? If yes, how is the process done when there is not a connection between the controller and the control element?

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4. Claim 1 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

a. The following terms renders the claims indefinite:

- i. a) (since there is only one step in the claim, there is no need to number the step. Please remove "a)").

Claim Rejections - 35 USC § 103

5. Claims 1-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Crater et al (Hereinafter Crater), U.S. Patent Number 5,805,442.

6. As per claim 1, Crater taught the invention substantially as claimed including a method for adapting a general purpose query protocol for use by an industrial control system, the industrial control system including a controller for providing control (col.6, lines 21-29) over an industrial process through at least one control element and at least one monitoring element each coupled to the network via a network I/O device (col.4, lines 18-29, col.6, lines 21-23, 38-58), the controller for performing control via a communication network according, and in providing such control the controller communicates with the network I/O devices according to the general purpose query protocol (col.6, lines 38-58), the method comprising the step of:

- a. Making a permanent-type connection to the network I/O device for the control element or for the monitoring element based on an analysis of communication

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transactions between the controller and the control element or the monitoring element (col.6, lines 38-58, 61-67, col.8, lines 4-6, 13-16);

Thereby specializing the general purpose query protocol (col.6, lines 38-58), which would ordinarily be used in computer-to-computer communications for making ad hoc queries of an external device, to use by the industrial control system in performing frequent communication of control and monitoring information between the controller and the control element or the monitoring element of the industrial control system (col.8, lines 38-52).

7. Crater did not specifically disclose about OSI seven-layer model. However, it is well known in the art that TCP, used in Crater's control system, is defined protocol of the Transport layer of OSI seven-layer model for network communication. It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the use of OSI model in Crater's control system for communication purposes.

8. As per claim 2, Crater taught the invention substantially as claimed in claim 1. Crater further taught that the permanent-type connection is a connection, at the transport layer of the network communication model, that is left open for later use after an earlier use (col.4, lines 18-29, col.8, lines 38-52).

9. As per claim 3, Crater taught the invention substantially as claimed in claim 2. Crater did not specifically teach the step of making available use of a protocol in which a single command from the controller performs both a read register and a write register instruction. However,

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Crater taught that the control parameter can be modified (col.8, lines 64-67, col.9, lines 1-7). It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the control parameter in Crater's system to an authorized client to perform both read and write register operation in a single command depending on the client's authority level.

10. As per claim 4, Crater taught the invention substantially as claimed in claim 3. Crater did not specifically teach that the protocol is compatible with the open MODBUS/TCP protocol. However, since MODBUS/TCP is a communication protocol designed to allow industrial equipment such as Programmable Logic Controllers, computers, operator panels, motors, sensors, and other types of physical input/output devices to communicate over a network and is simple for administrating and enhancing, one of ordinary skill in the art would have been motivated to apply such protocol to the use of industrial controllers. It would have been obvious to one of ordinary skill in the art at the time the invention was made to implement MODBUS/TCP protocol to Crater's system to support network communication for the controllers.

11. Claims 5-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Crater et al, U.S. Patent Number 5,805,442, as applied to claims 1-4 above, and further in view of Pettit et al (hereinafter Pettit), U.S. Patent Number 4,669,040.

12. Pettit was cited in the last office action.

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13. As per claim 5, Crater taught the invention substantially as claimed in claims 1-4. Crater did not specifically teach to include the steps of:

- a. Rate tuning the controller so as to adjust how often to communicate with the control element or the monitoring element; and
- b. Duration tuning the controller so as to adjust how long to wait for the control element or the monitoring element to respond to a query.

Pettit et al taught the steps of rate tuning and duration tuning (col.1, lines 15-19, 33-38, 44-50, col.2, lines 9-21, 35-40, 49-56, col.6, lines 46-50, line 65 to col.7, line 1). It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Crater and Pettit et al because Chaffee et al's tuning method enables Crater's control system to also control the communication frequent rates and respond periods of the elements.

14. As per claim 6, Crater and Pettit et al taught the invention substantially as claimed in claim 5. Crater further taught that the network is an Ethernet-type network (col.6, lines 50-58).

15. As per claim 7, Crater and Pettit et al taught the invention substantially as claimed in claims 5-6. Crater further taught that the controller is a programmable logic controller (col.1, lines 6-9, 15-22).

Conclusion

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16. Applicant's arguments with respect to claims 1-7, filed on 12/23/2002 have been considered but are moot in view of the new ground(s) of rejection.

17. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

18. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kenny Lin whose telephone number is (703)305-0438. The examiner can normally be reached on 8 AM to 5 PM Tuesday to Friday and every other Monday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Meng-Ai An can be reached on (703)305-9678. Additionally, the fax numbers for Group 2100 are as follows:

Official Responses: (703) 746-7239

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After Final Responses: (703) 746-7238

Draft Responses: (703) 746-7240

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)305-5140.

ksl

June 2, 2003


MENG-AL. T. AN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2100